Claims

1. Method for determining the signal-to-noise ratio (OSNR) of arbitrarily polarized optical signals (S) of different wavelength which are combined to form a WDM signal, according to a polarization nulling method,
characterized in that
power spectra (LS) of the WDM signal for a first defined setting m = 1 (m = 1, 2, ... M) of a first polarization-optical phase controller (E1) and for N (n = 1, 2, ... N) settings of a second polarization-optical phase controller (E2) are recorded and stored,
from the power spectra (LS) a maximum deviation (A_1) is determined for the optical signals (S) and stored,
the power spectra (LS) of the WDM signal for (M-1) new settings of the first phase controller (E1) and for N settings in each case of the second phase controller (E2) are then recorded and stored,
from these stored power spectra (LS) for each setting of the first phase controller (E1) the maximum deviations (A_m) with m = 1, 2 ... (M-1) of the signals are determined and stored, and
on the basis of all deviations (A_1, A_2, ... A_M) the signal-to-noise ratio (OSNR) is calculated for the optical signals (S).

2. Method according to Claim 1,
characterized in that
the deviation (A_m) (i=1, 2, ... M)) of an optical signal (S) is determined by means of an interpolation.

3. Method according to Claim 1 or 2,
characterized in that
the signal power of the optical signal (S) is determined by means of interpolation of the squared deviations.

4. Method according to Claim 1, 2 or 3,
c h a r a c t e r i z e d i n t h a t
by measuring the power at the input of the polarization controller a sum of the signal and noise power is determined from which a noise power is determined by subtracting the determined signal power of the optical signal (S).

5. Method according to one of the preceding Claims,
characterized in that
the number of polarization controller settings is selected on a minimum basis depending on a specified relationship between precision determination of the signal-to-noise ratio (OSNR) and measurement time.

6. Method according to one of the preceding Claims,
c h a r a c t e r i z e d i n t h a t
the phase shifts between the components of the electrical field vector of an optical signal (S) and the polarizer (POL) are performed by means of phase retarder plates as polarization-optical phase controllers, and the phase retarder plate (E1) can be set using the rotation angles (δ1, δ2, ..., δM) and the phase retarder plate (E2) can be set using the rotation angles (θ1, θ2, ..., θN).

7. Method according to Claim 6,
c h a r a c t e r i z e d i n t h a t
the settings of the first and second phase retarder plates (E1) and (E2) are implemented in such a way that a first phase shift is set for a first rotation angle (δ1) of (E1) and a plurality N of angles (θ1, θ2, ..., θN) are set for (E2) from which a set of N power values is recorded,
from these power values a first sinusoidal interpolation curve is determined whose deviation (A_1) is stored in a table,
the settings of the angles (θ1, θ2, ..., θN) are repeated for further rotation angles (δ2, ... , δM) with m>1 for recording

further power values from which further deviations (A_2, ... A_M) are stored whose values are squared and interpolated with another sinusoidal curve (SIN) as a function of (δ1, δ2, ... , δM), the signal power of the optical signal is determined from the deviation of the sinusoidal curve (SIN), by means of which the signal-to-noise ratio (OSNR) is derived for the optical signals (S).

8. Method according to one of the preceding Claims, characterized in that to record the power values of an optical signal (S) a resolution cell with a bandwidth equal to or less than the spectral width of a channel of a WDM signal is selected.

9. Device for determining the signal-to-noise ratio (OSNR) of arbitrarily polarized optical signals (S) of different wavelength which are combined to form a WDM signal, according to a polarization nulling method, wherein after passing through a first and a second polarization-optical phase controller (E1, E2) the optical signal (S) is injected into a linear polarizer (POL) with following optical spectrum analyzer (OSA), characterized in that there is added to the optical spectrum analyzer (OSA) a memory unit (SE) for tabulating the power values of the spectra measured at the optical spectrum analyzer (OSA) for different settings of the phase controllers (E1, E2), and there is connected to the optical spectrum analyzer (OSA) a determination unit (EE) for calculating the signal-to-noise ratio (OSNR) by interpolation and deviation searching of the power values recorded at the optical spectrum analyzer (OSA).

10. Device according to Claim 9, c h a r a c t e r i z e d i n t h a t the first polarization-optical phase controller (E1) is a $\lambda/4$ plate and the second polarization-optical phase controller (E2) is a $\lambda/2$ plate.